

# Commentary—Anatomy of Racial Disparity in Influenza Vaccination

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The Institute of Medicine report, *Unequal Treatment*, documents the presence of racial/ethnic disparities in health care across multiple procedures. It concluded that stereotyping, biases, and uncertainty on the part of health care providers all contribute to unequal treatment while also acknowledging the role of access and patient factors (Institute of Medicine 2002). Yet, despite the large number of studies documenting disparities in health care, few have sought to quantify the relative role of provider, patient, and access factors to disparities.

Large racial/ethnic disparities have been consistently documented in use of expensive, invasive technology including coronary revascularization procedures (Epstein et al. 2003), organ transplantation (Ayanian et al. 1999; Epstein et al. 2000), cerebrovascularization management and treatment (Lillie-Blanton et al. 2002), and knee and hip arthroplasty (Institute of Medicine 2002; Skinner et al. 2003). Disparities have been less consistently documented in the provision of primary care procedures. For example racial/ethnic disparities in screening for breast, cervical, colon, and prostate cancer range from small to nonsignificant (Swan et al. 2003). A study of directly observed primary care visits showed no evidence in racial disparity in care (Williams, Flocke, and Stange 2001). However, elderly African Americans and Hispanics consistently report lower rates of influenza vaccines. In 2002, only 48.5 percent of elderly African Americans and 50.7 percent of Hispanics reported receiving the vaccine compared with 69.6 percent of whites (Centers for Disease Control and Prevention 2003).

## IMPORTANCE OF DISPARITIES IN FLU VACCINE

Disparity in influenza vaccination has a substantial impact on minority population health. In recent years, influenza has accounted for upwards of 50,000 deaths annually (Thompson et al. 2003). Ninety percent of these deaths occur among the elderly and most are cardiovascular related (Thompson et al. 2003). Vaccination reduces overall mortality including deaths from

cardiovascular disease from influenza by 30 percent (Gross et al. 1995). Based on estimated 2.9 million elderly African Americans and 2.1 million elderly Hispanics, the elimination of racial and ethnic disparity in influenza vaccination would result in an additional 1 million elderly minority persons being vaccinated. Thus, it is plausible that disparity in influenza vaccination not only contributes to racial and/or ethnic disparity in influenza/pneumonia deaths but also to racial disparity in deaths from cardiovascular disease, cerebrovascular disease, and diabetes (Valdez et al. 1999; Nichol et al. 2003).

Disparity in influenza vaccination also represents a useful model for improved understanding of disparities in health care. Influenza vaccines are administered frequently enough and disparity is sufficiently large so that enormous samples are not required to examine causes. No referral is required for vaccination. Following informed consent of the risks and benefits, the intervention is immediately administered, obviating the need for further patient follow-up or adherence.

## POTENTIAL CAUSES OF DISPARITIES

Despite compelling reasons for studying it, little attention has been given to examining the causes of this disparity. The causes of these disparities are not known. As with most disparities in health care, potential explanations for disparity in influenza vaccination can be grouped into at least five major categories. First, less frequent use of care because of various access barriers could contribute to disparities. African Americans and Hispanics have fewer office visits than non-Hispanic whites (Greenblatt 2003), so they have less opportunity to receive a particular intervention. Second, controlling for age, minorities report worse health status and more comorbidities than whites (Ren and Amick 1996; McGee et al. 1996; Ostchega et al. 2000). In theory, this should result in higher vaccination rates based on higher risk status. In practice, other conditions compete for providers' time and attention and patients with greater morbidity often receive less preventive care (Nutting et al. 2001). African Americans and Hispanics have lower educational levels than whites and education level is a strong predictor of receipt of preventive care (Swan

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et al. 2003). Third, patients' knowledge and attitude toward the intervention might differ by race and ethnicity. For example, some studies suggest that African Americans are more risk averse (Shapiro et al. 1969; Oddone et al. 1998) and more concerned about being experimented upon by physicians without their knowledge or consent than whites (Corbie-Smith, Thomas, and St George 2002). Fourth, unconscious provider bias may affect delivery of care so that a provider may be more likely to vaccinate a white rather than a minority patient. Last, minority patients may see providers who are less inclined to administer these vaccinations. Distinguishing these competing explanations is critical to the design of interventions to address these disparities.

## NEW FINDINGS

Through creative use of secondary data, Herbert et al. (2004) explore these important questions. Their data source is the 1995–1996 Medicare Current Beneficiary Survey (MCBS) Access to Care files (available at [http://www.resdac.umn.edu/MCBS/data\\_documentation.asp](http://www.resdac.umn.edu/MCBS/data_documentation.asp) [accessed December 2, 2004]). The MCBS links survey data from a representative sample of Medicare beneficiaries with the respondents Medicare claims. The advantage of this unique data set is that it combined self-reported sociodemographic data (race/ethnicity, educational level, income, and marital status), self-reported health (health conditions, health status, functional measures), and other survey data (e.g., reasons for declining an influenza vaccination) with claims data (provider, date of visit, primary and secondary diagnoses, and procedural codes).

Compared with non-Hispanic whites, African Americans have 23 percent lower absolute rates of vaccination while Hispanics have 14 percent lower rates. The study first seeks to explain these differences by examining patient attitudes toward the vaccine among the unvaccinated. The distribution of reasons for not receiving the influenza vaccination differs by ethnicity but not race. African Americans cite the same reasons as whites for not receiving the vaccine, but Hispanics report fewer resistant attitudes. Based on other studies showing that resistant attitudes are associated with a lower likelihood of receiving the vaccine, the authors conclude that resistant attitudes contribute to racial, but not ethnic disparity, in receipt of the vaccine. This conclusion seems reasonable, but an attempt to quantify this contribution based only data from the unvaccinated seems premature because the strength of the association between resistant attitudes and vaccine receipt cannot be assessed from these data.

Unvaccinated African Americans were as likely as unvaccinated whites to report that they did not know the vaccine was needed or they did not think of it or missed it, or that the doctor did not recommend it. Each of these reasons reflects problematic provider–patient communication. Because rates of nonreceipt of the vaccine for African Americans (56.7 percent) were more than twice those of whites (23.4 percent), these findings suggest that poor provider communication contributes to this disparity. Among Hispanics, communication may be even more problematic. Significantly more Hispanics than whites reported that they did not know the shot was needed or forgot about it/missed it. These findings may reflect poor communication related to differences in language (Fiscella et al. 2002).

Based on comparisons of visit frequency by race and ethnicity, the authors conclude that access makes only a modest contribution to disparities in vaccination. Both African Americans and Hispanics show only slightly fewer visits before and during influenza season. These conclusions are supported by survey data of the unvaccinated. Only a negligible portion of African Americans or Hispanics cited transportation or cost as a reason for not receiving the vaccine.

Lastly, the authors examine the role of discrimination. Discrimination in health care is challenging to study. In previous studies, discrimination has been inferred based on provider response to videotapes or vignettes of simulated patients (Schulman et al. 1999; Weisse et al. 2001), by excluding competing explanations (Ayanian et al. 1999; Epstein et al. 2000; Griggs et al. 2003), or from the presence of stereotypical provider attitudes (van Ryn and Burke 2000). This study uses an ingenious design to assess discrimination. They match African-American patients, who had a medical encounter with their usual provider when influenza vaccines are given, with white patients who had a visit with the same provider during the same period. Among this selected subsample, disparities were largely explained by significantly higher rates of visits by whites where influenza/pneumonia vaccination was the principal code listed on the claim. In contrast, there was no difference by race/ethnicity in vaccination as an adjunct to other visits. The average reimbursement per claim and number of procedures performed were *lower* among black patients, suggesting that competing provider demands was not an explanation at least in this subsample. On the basis of this evidence, the authors conclude that there is little evidence of provider racial bias in the administration of influenza vaccine, but that racial differences in patient initiative and source of care contribute to these disparities.

Are these findings regarding the absence of discrimination valid? The markedly higher crude and adjusted rates among whites of

vaccination-dedicated encounters in both the matched subsample and the full sample suggests that patient initiative plays an important role in explaining these disparities. Differences in provider coding style or use of patient reminder systems would not explain findings in the subsample as both groups of patients saw the same providers. Selection bias would not explain comparable findings in the full sample.

Inferences of discrimination hinge on racial differences in vaccination rates in visits where vaccination was coded as a secondary diagnosis. In contrast to the matched subsample, in the full sample, these rates differ significantly. The authors attribute these differences to “compositional effects” or greater use by minorities of providers who have lower propensities to vaccinate. Unfortunately, the sample size of MCBS is too small to directly test this hypothesis. There are two alternative explanations for the apparent absence of discrimination: limited statistical power and selection bias. As the authors acknowledge, their study has only 25 percent power to detect a difference in the groups of 5 percent. Thus, sizable differences could easily be missed. Furthermore, providers and patients selected for the subsample might differ systematically from the full sample in ways that could account for this difference. For example, providers with more racially diverse practices would be more likely to be included in the matched sample. Such providers might exhibit less bias than other providers. The finding that rates of Medicare claims for vaccines for white and blacks differed between the subsample (70.4 percent, 35.1 percent) and full sample (42.3 percent, 17 percent) suggests important differences between these two groups.

The authors acknowledge several important limitations to the study, but neglect to discuss the potential for response bias. The response rate to both years is roughly 70 percent (Research Data Assistance Center 2004). It is possible that subject characteristics, including attitudes toward vaccination and access to care, systematically differ between nonresponders and responders to the MCBS. Bias could be assessed by comparing vaccination claims by race and ethnicity between subjects in the MCBS with those from a probability sample of Medicare claims.

## IMPROVED UNDERSTANDING

The findings of Herbert et al. (2005) have important implications for understanding the causes of racial disparity in influenza vaccination. First, access can be excluded as a significant contributor in this sample. This finding is not

surprising given that Medicare pays for both visits and influenza vaccinations. Access is likely to be more important among those who lack Medicare coverage such as undocumented immigrants and selected other noncitizens.

Second, differences in patient sociodemographic characteristics and morbidity explain only a moderate portion of the disparity. A comparison of the crude and adjusted differences between whites, blacks, and Hispanics indicates the magnitude of this contribution. This finding is consistent with previous work (Schneider et al. 2001; Marin, Johanson, and Salas-Lopez 2002; Egede and Zheng 2003).

Third, resistant attitudes likely contribute to disparity for blacks, but not for Hispanics. The finding for blacks is new. The finding for Hispanics is consistent with an earlier study (CDC 1997). Two important questions remain unresolved. The size of the contribution of resistant attitudes to racial disparity in vaccination remains uncertain. More importantly, it is not known to what extent these attitudes are amendable to change through improved provider-patient communication.

Fourth, another attitudinal factor, patient initiative, may contribute substantially to disparity in vaccination. Rather than physicians prompting patients regarding the need for vaccination as an adjunct to other visits, these data suggest that most vaccinations result from vaccine-dedicated visits, many of which are likely patient initiated. Differences in vaccine-dedicated visits explain the largest portion of racial and ethnic disparities in vaccination.

Previous studies have focused primarily on racial differences in risk aversion, (Shapiro et al. 1969; Oddone et al. 1998; Ayanian et al. 1999) but have largely ignored the role of patient initiative or demand for care. Attitudes toward medical interventions may represent a continuum ranging from active resistance to active demand. This study breaks new ground in suggesting that both ends of the continuum may contribute to racial disparity in influenza whereas only the patient demand side contributes to ethnic disparity. Future research should focus on development of reliable, valid scales that capture the full spectrum of patient attitude toward particular procedures as a means of assessing the contribution of patient attitudes to racial disparity in various procedures.

Fifth, provider bias does not appear to be a *major* cause of disparity in vaccination. Although findings from the subsample are limited by statistical power and potential selection bias, they are supported by data showing that only 12.2 percent of African Americans, compared with 12.5 percent of whites, cited the physician as a reason for not receiving it. Furthermore, it is not obvious why providers would exhibit significant bias in the administration

of vaccines, but not other preventive care, unless they repeatedly encountered white patients who requested it and minority patients who declined it.

Lastly, the contribution of compositional effects remains uncertain. Previous studies show that African-American Medicare beneficiaries are more likely to obtain care from less qualified providers (Bach et al. 2004) and receive surgery from less skilled surgeons (Mukamel, Murthy, and Weimer 2000). It is conceivable that differences in source of care contribute significantly to differences in vaccination rates. This question merits examination using a larger Medicare sample.

## IMPLICATIONS FOR ELIMINATING DISPARITIES

The study findings have important implications for addressing disparities. While the study tends to point away from provider bias a major contributor, the study findings are consistent with the notion that poor communication may contribute to disparities (Ashton et al. 2003). Patients' knowledge and attitudes toward vaccination do not occur in a vacuum, but are strongly dependent on provider–patient trust and communication (Chi and Neuzil 2004). Moreover, minority patients report lower trust in their physicians (Doescher et al. 2000) and less sense of partnership (Cooper-Patrick et al. 1999). Two-thirds of minority patients had visits during vaccination weeks and most of the reasons cited by respondents for not receiving vaccinations are potentially addressable through improved provider–patient communication and relationship building (Fiscella 2002).

Providers can address patient skepticism by eliciting patients beliefs and directly addressing them (Carrillo, Green, and Betancourt 1999). This allows the provider the opportunity to address patient misconceptions and promote trust. Providers may benefit from specific training in these skills (Betancourt 2003). Hispanic patients whose preferred language is Spanish benefit from professional interpretation (Morales et al. 1999; Jacobs et al. 2001). Once adequately informed of the vaccine's benefits, many more minority patients will likely initiate vaccine-dedicated visits.

Improving practice-wide vaccination rates requires the implementation of systems that can recall eligible patients during vaccination weeks and prompt providers to administer the vaccine at the time of the visit and provide outreach to those missed (Nichol 1991, 1992). Such systems are particularly needed in practices that serve large numbers of minority patients such as hospital-based clinics and federally qualified community health centers

(Forrest and Whelan 2000). The Veterans Administration Health System has used these approaches to achieve influenza vaccination in excess of 90 percent while eliminating racial disparity in vaccination (Zimmerman et al. 2003). A community-based program, using tracking, recall, and outreach, virtually eliminated disparities in childhood immunizations between predominantly minority, inner-city children and white suburban children (Szilagyi et al. 2002). Preliminary data from the Rochester Racial and Ethnic Disparities in Immunization Initiative program show that this approach can be successfully extended to adult immunizations. Rates of influenza vaccine more than doubled among African-American patients and racial disparities were significantly attenuated (N. Bennett, personal communication, August 2, 2004). Together, these findings suggest that the elimination of racial and ethnic disparities in influenza vaccination is an attainable national goal.

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